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### The Effect of Hypertension Education on Knowledge, Lifestyle Behaviors and Blood Pressure Management Among Parishioners in a Faith-Based Setting

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Nursing

## **DOCTOR OF NURSING PRACTICE (DNP) PROGRAM**

### **A DNP PROJECT**

**The Effect of Hypertension Education on Knowledge,  
Lifestyle Behaviors and Blood Pressure Management  
Among Parishioners in a Faith-Based Setting**

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**Date of Degree: Spring, 2020**

**The George Washington University**

**DNP Project Approval Signature Sheet**

**The Effect of Hypertension Education on Knowledge, Lifestyle Behaviors  
and Blood Pressure Management Among Parishioners in Faith-Based Setting**

A Project Presented to the Faculty of the School of Nursing

The George Washington University

In partial fulfillment of the requirements


For the Degree of Doctor of Nursing Practice


By

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### Abstract

**Background:** Hypertension (HTN) is a major risk factor for life threatening events. Although evidence supports using faith-based settings to provide health education to better manage chronic conditions and prevent complications, HTN education is underutilized in this setting.

**Aims/Objectives:** This project aimed to assess the effectiveness of HTN education on knowledge, self-reported lifestyle behaviors and blood pressure (BP) management among parishioners in a suburban church.

**Method:** A pre-post educational intervention was used in this evidence-based project. BP screening identified 56 eligible adults and a convenience sample of 44 parishioners with HTN were enrolled. Participants received two 45-minutes educational sessions. Pre- and post-intervention HTN knowledge scores and lifestyle behavior were compared using paired t-test. The differences in pre-, post-, and 2-week post-intervention systolic blood pressure (SBP) and diastolic blood pressure (DBP) were compared using a repeated measure ANOVA.

**Results:** 36 participants completed the study. There was an increase in HTN knowledge scores (9.31 to 13.6,  $p<0.001$ ), increase in number of minutes participants exercised (123.23 minutes to 167.1 minutes,  $p=0.023$ ), increase in number of participants watching their salt/sodium intake (57.6% to 84.8%,  $p=0.012$ ), and decrease in SBP (139.11 mmHG to 132.4 mmHG,  $p=0.016$ ). BP changes sustained to 2-weeks post intervention.

**Conclusion:** Providing HTN education in a faith-based setting is effective to favorably impact disease risk factors in the short term, fosters an environment of sustained support to engage parishioners, and can serve as a catalyst for spread into the community. Further study is recommended to evaluate longer term impact on disease management.

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### **Introduction**

High blood pressure (HBP) also called Hypertension (HTN) happens when the force of your blood pushing against the walls of your blood vessels is consistency too high. HTN is defined by the American College of Cardiology (ACC) and the American Heart Association (AHA) as an abnormally high arterial blood pressure (BP) in adults when the systolic blood pressure (SBP) is 130 mmHg or greater or the diastolic blood pressure (DBP) is 80 mmHg or greater (Whelton, et al., 2018). The AHA, ACC, Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) all state that HTN is a leading independent risk factor for cardiovascular disease, cerebrovascular accidents (strokes), heart disease and failure, and chronic kidney disease and failure (AHA, 2016; Cifu & Davis, 2017; Merai, et al., 2016; WHO, 2020). It is a significant health problem not just globally but for millions of Americans as well. It is estimated that half of adults in the United States have HTN and only one in four of these adults have their BP under control (CDC, 2020). Uncontrolled HTN is defined in accordance with BP treatment targets recommended by the Eight Joint National Committee Criteria (2018) of a SBP equal to or greater than 130 mmHg and a DBP of equal to or greater than 80 mmHg (Whelton, et al, 2018). Given the trends and increasing prevalence rates of HTN with increasing age, limited access to care, and increased co-morbidity, the consequences of HTN are expected to increase (CDC, 2016; Whelton, et al., 2018). Recommended non-pharmacological evidence-based interventions including education, lifestyle behavior modification, and medication adherence to manage HTN have been shown to decrease BP and reduce the incidents of heart disease, strokes, and kidney failure (Cifu & Davis, 2017). However, underutilization of these evidence-based approaches to HTN management has been identified as the biggest risk factor for uncontrolled HTN (Fitzgerald, 2011, Sessoms, et al., 2015). Despite the benefits of

these interventions to control HTN, it remains an important public health challenge in the United States (CDC, 2017; Sessoms, et al., 2015).

Evidence-based education and self-management support for HTN and other chronic diseases are two integral components of the chronic care model with strong evidence showing a link to positive health outcomes, including lowering BP, improving HTN-related knowledge, and enhancing competence in self-management behavior (CDC, 2017). Additionally, these interventions are widely supported by federal and nonfederal initiatives, including CDC's Million Heart Initiative, Healthy People 2020, and the Triple Aim (Beigi, et al., 2014; CDC, 2017; Cooper & Zimmerman, 2017). Lack of HTN knowledge and awareness is identified in the literature as a barrier to management and an underlying cause of uncontrolled HTN (Khatib et al, 2014; Heinert et al. 2020). There is strong evidence supporting evidence-based educational interventions designed to improve management of HTN in community settings which has shown to improve knowledge and self-management (Abu et al., 2018; Beigi, et al., 2014; Darrat, et al., 2018; Lu, et al., 2015). Health promotion interventions delivered in faith communities can reach broad populations, have great potential for reducing health disparities, and has proven to produce significant impacts on a variety of health behaviors (Campbell, et al., 2007). Further, HTN education for parishioners in faith communities with keen collaboration across healthcare and faith leaders are supported and recommended in the literature (Bangura et al., 2017; Cooper & Zimmerman, 2017; Schoenthaler, et al., 2018).

This DNP project focused on an interactive and tailored educational intervention aimed at improving HTN knowledge to increase awareness and modify lifestyle behaviors to better manage BP among hypertensive parishioners in a suburban community church. Faith-based settings can be successful vehicles for disseminating health information and promoting healthy



behaviors as faith leaders have a positive influence on parishioners (Heward-Mills, et al., 2018; Levin, 2014). Hence, there is a need for healthcare professionals to collaborate with these community leaders to enhance the health of their communities and support transition of care for patients beyond the clinical setting.

### **Background and Significance**

HTN is a serious medical condition that significantly increases the risks for heart disease, strokes and kidney disease and failure (WHO, 2020). However, despite evidence-based approaches in place to manage this chronic condition, the rates for mortality and disability keeps rising. Recent guidelines published by the ACC and AHA in 2017 redefined the criteria for HTN as a SBP of 130 mmHg or greater and a DBP of 80 mmHg or greater (Dorans, et al., 2018; Whelton, et al., 2018). In 2017, there were 108 million adults in the United States who have HTN, which is nearly half of all adults (45%) in the United States (CDC, 2020). Further, only one in four (24%) of these adults with HTN have their condition under control (CDC, 2020; Million Hearts, 2020). In 2017, HTN was a primary or contributing cause of death for over 472,000 Americans accounting for more than 1,300 deaths each day (CDC, 2020). Additionally, the economic burden of this disease on the United States is an average of \$131 billion each year and includes cost of health care services, medications, and missed work days (CDC, 2020). The prevalence of HTN increases with age and accounts for 33.2% among those aged 40–59 years old and 63.1% among those aged 60 years old and over, and estimates showing a greater percent of men (47%) have high BP than women (43%) (CDC, 2020).

HTN is often a modifiable risk factor for the majority of patients but given the persistent high rates of uncontrolled HTN, the ACC and AHA published new guidelines in 2017 recommending non-pharmacologic interventions for better management of HTN which include

weight loss, a healthy diet, reduced intake of dietary sodium, enhanced intake of potassium, increased physical activity, and moderation in alcohol (Whelton, et al., 2018). Lack of knowledge regarding the importance of HTN and BP screening appears to be the most common barrier to HTN awareness and must be addressed in any intervention aimed to improve BP control (Heinert, et al., 2020; Khatib et al., 2014; Morgado, et al., 2010; Sa'adeh, et al., 2018). Several studies done to educate people in the community settings about HTN have shown to improve knowledge, lifestyle behaviors and BP control (Abu, et al., 2018; Beigi, et al, 2014; Darrat, et al., 2018; Park, et al., 2011; Schapira, et al, 2012).

With the 2017 ACC/ACA updated guidelines redefining HTN as 130/80 mmHg or greater, which is a change from 140/90 mmHg or greater, a larger population is now considered potential candidates for monitoring and treatment (AHA, 2018). Healthy People 2020 goals are to reduce the number of adults with HTN from 29.9% to 26.9%, increase the proportion of adults with controlled HTN from 43.7% to 61.2%, and increase the number of adults with HTN controlled with prescribed medications from 63.2% to 69.5% (Healthy People 2020, 2019). Additionally, controlling HTN is a priority for the AHA as it recognizes the urgent need to address inadequate control and has a goal to improve cardiovascular health by 20% and reduce mortality rate by 20% by the year 2020 (Go, et al., 2014). These goals are similar to the goals for HTN control established by the Million Hearts Initiative, the WHO, and the Institutes of Medicine (IHI) Triple Aims and highlight the critical need for healthcare professionals to increase their efforts with providing evidence-based interventions to help patients prevent and better manage their HTN (Million Hearts, 2020; IHI, 2019; WHO, 2020).

To achieve these objectives, addressing the barriers to HTN control by providing recommended evidence-based interventions such as HTN education to increase knowledge about

awareness and lifestyle behavior modifications to control BP are warranted. Faith-based settings offer a safe, trusted and spiritual environment for many individuals where positive influence and behavioral changes are likely to happen (Baruth et al., 2015). There is also strong evidence suggesting that faith leaders have an immense influence on parishioners' health behavior and, as a community resource, could better be positioned to organize and foster community participation in health matters (Baruth et al, 2015; Dodani et al., 2011; Heward-Mills et al., 2018). Multiple community educational programs have been successfully implemented in faith-based and other community settings to promote healthy behaviors and proven effective (Bangurah et al., 2017; Cooper & Zimmerman, 2017; Schoenthaler, et al., 2018). Thus, healthcare providers should consider collaborating with faith leaders to enhance the health of their communities.

This DNP project is significant because it engages healthcare, individuals and faith community leaders in a health promotion effort to improve disease management and health outcomes, provides opportunities for collaboration across healthcare and communities, has the potential to inform nurse leaders, and can serve as a catalyst for community spread to manage chronic diseases outside of the clinical setting. Importantly, it supports the goals of the CDC, AHA, ACC, IOM, Million Hearts Initiative, Health People 2020, and WHO to prevent and control HTN in community settings, improve population health outcomes and reduce healthcare costs.

### **Needs Assessment**

A needs assessment of the church was conducted to establish internal elements of strengths, weaknesses and external elements of opportunities and threats (SWOT). These are summarized in a SWOT analysis in Appendix A. The greatest strength of this church is that it has an effective leadership structure which is comprised of six pastors, several ministry leaders and a parish nurse who are the decision makers for different church activities. This effective

structure enhances communication between the church, its parishioners, and the community to ensure that they deliver the services that are meeting the needs of those they serve. The leadership team offers strong support for providing social and health benefits to its community. The mission and values of this organization are to glorify God and make disciples for Jesus while serving and growing God's people to bring hope and healing through worship, community outreach and health promotion. Leaders are knowledgeable about the health needs of their congregation which can help with the successful implementation of a health promotion program. The church has an active and updated website in addition to a Facebook page on which it shares information and advertises church activities to members and the community in general. Other strengths include modern large facilities, advanced technology such as big screens and computers, administrative staff onsite every weekday and ample parking for events.

The church's greatest weakness is that the current parish nurse serves in a part time volunteer position which can impact the sustainability of a health promotion program. Additionally, there are limitations relating to when the program can be offered as educational sessions cannot be offered during Sunday worship times or small group ministries such as bible studies. The church's greatest opportunity is that this project can lay the groundwork for a tailored, interactive and community engaged approach to successfully implement evidence-based interventions within a health promotion program at this project site. The leadership team expressed the need to provide more health-related activities for its parishioners. Partnering with the local hospital, health department and other community stakeholders and seeking out opportunities for grant funding for health promotion activities can provide the opportunity for increased community engagement and strategies for sustainability of this program. The greatest threat of this program is if the parish nurse can no longer volunteer in this role, there will be no

health expert to oversee the program. The affluent nature of this community may be viewed as a threat as well since many may not be interested in community education because they may receive this education directly from their personal health providers.

### **Problem Statement**

HTN control is of critical importance in the prevention strategies of cardiovascular disease. According to CDC (2020), 45% of Americans adults have HTN and only 24% of them having their BP under control, with the risks for the disease increasing with age. Effective BP management has been shown to decrease the incidence of stroke, heart attack, and heart failure (Ambrosius, 2014; Zanchetti et al., 2015). However, despite all efforts, BP control remains below expectations. Among all factors affecting BP control, lack of knowledge has been identified as one of the most common barriers to HTN awareness and control (Khatib, et al., 2014; Heinert, et al., 2020).

Use of faith-based organizations to reach a wider population to impact health outcomes for community residents is supported in the literature. Churches and other faith-based organizations have become increasingly popular settings in which to conduct health promotion programs and research studies (Dodani, 2011). While educational interventions in the community-based settings have been shown effective in improving HTN awareness and knowledge, lifestyle behaviors, and improve BP control for hypertensive study participants, this evidence has not been translated into practice in this suburban community church.

### **Purpose Statement**

The purpose of the project was to determine if an HTN educational intervention will improve HTN knowledge, modify lifestyle behaviors and decrease BP among parishioners ages 40 and over with a self-reported HTN diagnosis, a BP reading of 130/80 and over or currently

taking BP medications at a suburban community church. This project laid the groundwork for a tailored, interactive and community engaged approach to implementation of an evidence-based intervention within a faith-based health promotion program. Engaging and educating patients beyond the clinical settings and in places where they feel comfortable is critical for primary prevention of chronic diseases such as HTN (Dodani, 2011).

### **Aims**

This evidence-based project aimed to evaluate the effectiveness of an HTN educational on HTN knowledge, lifestyle behavior changes, and BP management among parishioners in a suburban community church.

### **Objectives**

- **Implementation:** Delivered two interactive 45-minute AHA guided educational sessions on HTN management to include elements of risk factors, diet, exercise, sodium intake, and medication adherence.
- **Improve HTN knowledge scores:** Compared pre and post intervention knowledge of parishioners using the Hypertension Evaluation and Lifestyle Management (HELM) tool.
- **Change Lifestyle Behaviors:** Compared pre and post lifestyle behavioral changes.
- **Lower BP measurements:** Compared pre, post and 2 weeks follow-up average SBP and DBP measurements.

### **Study Question**

What is the effect of an educational intervention, compared to the baseline, on HTN knowledge, lifestyle behavior modifications and BP control, among parishioners ages 40 and older at a suburban community church?

### **Review of Literature and PICOT**

The aim of conducting this literature review was to examine the study question stated above. PICOT is an acronym that assists in assuring that key components of a study are evaluated and includes: **P** = *Patient population*; **I** = *Intervention or issue of interest*; **C** = *Comparison intervention or issue of interest*; **O** = *Outcome*; and, **T** = *Time frame* (Stillwell, et al., 2010). *The PICOT for this study included: P* – Adult parishioners in a faith community; *I* - Education session guided by a theoretical framework and is tailored and interactive; *C* – Baseline knowledge score, lifestyle behavior and BP; *O* – Increase knowledge score, change in lifestyle behavior and decrease in SBP and DBP; and, *T* – Baseline, immediate post- and two-week post intervention.

### **Synthesizing the Body of Evidence**

The search for this literature review was completed between April 2019 to March 2020 by the DNP student. Evidence was gathered from PubMed, CINAHL, Scopus, and Google Scholar using several different search terms “hypertension, education, knowledge, BP control, barriers and facilitators, and faith community.” Results produced 442 articles which were assessed for eligibility and 399 were eliminated based on titles. Of the remaining 73 articles reviewed, 13 were deemed appropriate to answer the research question and were included in this literature review. Data was extracted independently and the quality of studies was evaluated using the Johns Hopkins Quality Appraisal tool (Dearholt & Dang, 2018). The expertise of a research librarian from The George Washington University (GWU) was utilized in this search. Inferences made from the literature aided in identification of gaps in practice, supported the effectiveness and practicality of providing education to improve HTN knowledge and lifestyle behaviors to improve BP control in a faith community and collaboration of health care and faith

communities in the management of chronic disease. A table summary of this literature review is presented in Appendix B.

***Lack of HTN education – a gap in practice***

Two studies have identified lack of HTN education and awareness as the most common barrier to HTN management. Khatib et al. (2014) conducted a systematic review and meta-analysis of qualitative and quantitative studies to examine patient and healthcare barriers to HTN awareness, treatment and follow-up. Findings revealed several barriers which included disagreement with clinical recommendations as the most common barrier among health care providers while lack of knowledge was the most common barrier to HTN awareness and management for patients. Both findings suggest a need for targeted-multifaceted interventions to improve awareness and management of HTN. Similarly, a second study by Heinert et al. (2020) was conducted in four community churches to assess barriers and facilitators to HTN control. This Community Targeting of Uncontrolled HTN (CTOUCH) study used focus groups to gain feedback on barriers and facilitators to HTN control. While social support, knowing how to control HTN and community resources were facilitators of HTN control, lack of both HTN knowledge and disease awareness were two areas identified as barriers. The authors of both studies concluded that knowledge of these barriers and facilitators can inform opportunities for successfully improving community-based HTN programs.

***Support for HTN education intervention***

Six studies provided strong evidence supporting education programs as an effective intervention to improve HTN knowledge, awareness, and lifestyle behaviors to better manage BP in community settings. Park, et al. (2011) examined the effectiveness of an integrated health education and exercise program in community-dwelling older adults with HTN in a randomized



controlled trial. The experimental group received health education, individual counseling, and tailor exercised program for 12 weeks while the control group received no care. SBP was significantly decreased and scores for exercise, self-efficacy and general health were significantly increased compared to that of the control group, indicating that an education program was effective in controlling SBP and improving-self efficacy for exercise and health-related quality of life. Similarly, Beigi, et al. (2014) conducted a quasi-experimental study of 112 hypertensive patients selected via systematic random sampling to determine the effectiveness of a short-term educational program on knowledge level, lifestyle changes, and BP control. The intervention was delivered in two one-hour training sessions per month over a three-month period on 100 patients. Results show that mean knowledge scores and lifestyle scores improved statistically and BP decreased. These findings indicated that a HTN educational program was effective in increasing HTN knowledge, improving self-management, and controlling BP. Similarly, in another observational, prospective cohort designed study conducted in a community-based setting, Darrat et al. (2018) explored the impact of a structured HTN educational intervention on patient knowledge, lifestyle behaviors and BP control. Participants were recruited through a BP screening and were randomly assigned to either a control group or an intervention group and data was collected over a 4-month period. The intervention group received a HTN educational intervention while the control group received usual care. While there were no significant differences between the two groups at baseline, there were significant improvements in HTN knowledge and awareness, exercise levels, and weight as well as greater reduction in both SBP and DBP in the intervention group. Additionally, Ozoemena, et al. (2019) conducted a quasi-experimental study on 400 retirees in two cities to determine the effectiveness of a health education intervention in improving HTN knowledge and self-care practices and

found that HTN knowledge score as well as self-care activities significantly increased from baseline to one month follow up than those in the control group. Findings in Ozoemena et al. (2019), Darrat, et al, (2018) and Beigi, et al., 2014) studies strongly suggest that providing tailored educational intervention can positively impact HTN knowledge, lifestyle behavior changes and control within a community setting.

In an effort to examine patients' knowledge about HTN and its association with heart healthy lifestyle practices and medication adherence, Abu et al. (2018) conducted a cross sectional survey of 385 adults in two primary care clinics using an 11-item measure to assess HTN knowledge and obtain self-reports on dietary changes, engagement in physical activity and medication adherence. Results indicated that while 85% of patients were properly identified as having HBP, more than two-thirds were unaware that HTN is a lifetime diagnosis, and one-third were unaware that HTN could lead to renal disease and failure. Additionally, patients with low HTN knowledge were less likely to reduce their salt intake and eat less to decrease their weight than patients with high HTN knowledge. The authors concluded that increased HTN knowledge was associated with healthy lifestyle practices and intensifying educational strategies may engage patients and optimize BP control.

Lu, et al. (2015) further looked at effective education strategies for health promotion programs. In a randomized controlled, non-blinded study to evaluate three different HTN health education strategies in the management of hypertensive patients in community health centers in China, Lu, et al. (2015) randomized participants in three groups for intervention over a 2-year period. Group 1 received self-learning; group 2 received monthly didactic lecture; and group 3 received monthly interactive education workshop. Outcomes of changes in BP, HTN knowledge score, adherence to BP medication, and lifestyle (salt intake and regular physical activity), body

mass index and serum lipids were evaluated. After 2 years, group 2 showed significant increase in BP but group 3 showed a more substantial increase in BP. Group 1 did not change significantly. Additionally, improvements in remaining outcomes were progressively greater from group 1 to group 2 to group 3. These findings suggest that an interactive education intervention may be the most effective strategy in community-based health promotion education programs for hypertensive patients in improving their HTN knowledge and mitigating clinical risk factors for preventing HTN-related complications.

### ***Support for HTN education in faith communities***

Faith-based settings offer a safe and trusted place for parishioners to improve their health. Schoenthaler, et al. (2018) used a randomized control trial to assess the comparative effectiveness of a therapeutic lifestyle changes (TLC) intervention plus motivational interviewing (MINT) versus health education (HE) alone, on BP reduction among 373 black participants with uncontrolled HTN in 32 New York City churches. The experimental group received 11 sessions of TLC and 3 sessions of MINT while the control group received one session of TLC plus 10 sessions of health topics delivered monthly by local experts. The experimental group had a significantly greater systolic BP reduction than that control group at 6 months and at 9 months, however, the reduction at 9 months was not significant. Findings suggested that a community-based lifestyle intervention delivered in churches led to significantly greater reduction in systolic BP in hypertensive blacks compared with HE alone which were similar to Lu, et al., (2015) findings. In another pre-post intervention study done in a faith community, Bangurah, et al. (2017) aimed to measure BP readings, dietary sodium intake behaviors and physical activity levels of 16 parishioners before and after a tailored educational intervention with data collected over a 4-week period. Results indicated that a nurse-led diet and

exercise teaching intervention led to lower BP readings over the 4-week period and highlights the importance and practicality of using faith-based settings to provide education to better manage HTN and prevent complications. However, further studies are needed to determine long term impact.

### ***Collaboration across healthcare and faith communities***

BP control is one of the measures of the national Million Hearts' initiative and its focus on prevention and community-clinical collaboration was a call to action for nurses in the community to collaborate with community and acute care leaders to better coordinate care and implement innovative measures to identify undiagnosed and uncontrolled HTN and improve management (Cooper & Zimmerman, 2017; Merai, 2011). Collaborating with faith-based leaders to empower parishioners through knowledge, coaching and other effective measures is effective and feasible in reaching this population. Cooper & Zimmerman (2017) conducted a one group pre-post designed study to measure BP and lifestyle satisfaction scores. The study was conducted by 39 trained parish nurses who offered a 3-month BP self-monitoring and coaching intervention over a 2-year period to 119 hypertensive or at-risk parishioners. Results showed decreased BP readings and improved lifestyle satisfaction scores in six out of the seven targeted areas across the program period. These findings indicated that coaching by nurses on disease management in faith settings and in collaboration with and support from faith leaders can create an environment of sustained support that can promote improved lifestyle behaviors and BP changes over time (Cooper & Zimmerman, 2017). These findings echoed similar findings in the Bangurah, et al. (2017) study.

### ***Validity and reliability of the HELM scale***

Ikwanudin, et al. (2015) utilized the HELM scale successfully and supported its validity and reliability in a quasi-experimental two-group study. Pre and post-test data were collected from 68 elderly patients selected from two Primary Health Centers in Indonesia and the study aimed to evaluate the effectiveness of the lifestyle modification program with objectives to provide HTN knowledge to improve lifestyle behaviors and decrease BP. Results showed that the mean score of knowledge were significantly higher while BP measurements were decreased between the intervention group and comparison group indicating a positive effect on improving hypertensive elders' knowledge and maintaining their BP. The authors also conducted a sample study to test the HELM tool on 30 hypertensive elders and found that the instrument had good internal reliability with Chronbach's alpha .89. These findings concur with those of Schapira, et al. (2012) who developed and tested the scale and found that HELM demonstrates content and construct validity in measuring the knowledge required for patients to take an active role in the chronic disease management of HTN.

### ***Influence of faith leaders on the health of parishioners***

Faith-based settings are increasing becoming popular in which to deliver health promotion programs since many Americans attend religious services one or more times a week and therefore, it is important to understand how to effectively capitalize on the strengths of faith leaders and engage them in promotion efforts (Baruth, et al., 2015). Baruth et al. (2015) conducted a qualitative study to explore the influence of faith leaders on health-related issues within their congregation through semi-structured interviews of 24 faith leaders and found that chronic conditions and poor health behaviors were the top health-related challenges facing their congregation. A majority mentioned current health-related activities in the churches, and believed they had influence on their congregation for issues related to health and wellness in the

form of raising awareness and being a role model. These findings were able to identify the role and influence of these leaders on health-related issues and programs in their congregation.

### **Recommendation**

The evidence gleaned from this literature review was deemed good and consistent in considering a health promotion program that addressed disease management at the project site. A tailored and interactive educational intervention coupled with lifestyle behavior changes to better manage BP were considered an evidence-based practice for disease management in a community setting. The evidence addressed the gaps in practice and was consistent with current barriers for HTN management and the church's needs and priorities. Additionally, the evidence supported the feasibility of sustainability. With stakeholder support and approval from senior leaders within the church, this study can be successfully implemented into the project site.

### **Evidence Based Translational Models**

The WHO has emphasized patient education as an important strategy to improve the active participation of patients in their disease management process given that there is strong evidence revealing that HTN control reduces the risk factors for mortality and disabilities resulting from heart and kidney diseases (Javadzade, et al, 2018). A theoretical framework is critical to describe how the educational emphasis on social, psychological, and cognitive variables can affect selfcare behaviors (Khorsandi et al., 2017). One such framework that is used frequently is the Health Care Belief Model (HBM). The HBM constructs are among the most crucial and effective factors in selfcare behaviors which are rooted in the individuals' health beliefs (Javadzade et al., 2018). In two studies, one randomized control trial and one quasi-experimental, done to assess the effect of HTN education that is grounded on the HBM theory, researchers found that the intervention increased the performance and enhanced the HTN health

beliefs in hypertensive people, and therefore, was recommended to consider the HBM to enhance self-care behaviors in hypertensive individuals (Javadzade, et al., 2018; Khorsandi, et al., 2017).

The HBM was utilized in the development of this educational intervention (see Appendix C1). The HBM posits that in order for participants to adopt selfcare and controlling behaviors, they must understand that they are susceptible to the disease (perceived susceptibility), that they may suffer the consequences and side effects of uncontrolled HTN (perceived severity), that controlling their lifestyle behaviors have some benefits for them (perceived benefits), that there are a few barriers against controlling behaviors (perceived barriers), that there are several ways to (for example, health ministry health promotion program) encourage them to adopt controlling behaviors (cues to action), and finally, they should feel that they are able to control HTN through correct behaviors (self-efficacy) (Khorsandi, et al., 2017). These constructs were included in the development of this study's educational module.

To guide the planning, implementation and evaluation of this evidence-based DNP project, a logic model was developed for by the DNP student. An effective logic model makes a detailed visual roadmap of the activities that are simple, engaging and will bring about change as well as results expected for the targeted community (CDC, 2011). It links several concepts: inputs which are resources acquired or necessary for program implementation; activities which is the actual intervention that will achieve project outcomes; outputs which are outcomes achieved as a result of activities implemented; outcomes which addressed the changes, impacts and results over time; and environmental factors which addresses any challenges faced during implementation (CDC, 2011). The Logic Model is a proven best practice model design and is critical to the overall success of future program planning and evaluation with multiple approaches (Ferdinand, 2012). One of the advantages in utilizing this approach was the effective

understanding of how the activities can impact outcomes to improve health status of communities and individuals and avoid unnecessary spending of human resources and finances that can restrict sustainability of healthcare (Ferdinand, 2012). The Logic Model design used to guide this DNP project's implementation, evaluation and dissemination is depicted in Appendix C2.

## **Methodology**

### **Study Design**

We used a pretest-posttest design. The intervention included two tailored face-to-face 45-minute interactive sessions on HTN education and management. The sessions were delivered to participants via a power point presentation by the DNP student in a classroom setting. The two-module educational curriculum was tailored to follow ACC and AHA guidelines found on their websites (Whelton, et al. 2018 & AHA, 2017). The first module focused on general HTN knowledge and risk factors associated with uncontrolled BP while the second module focused on how to modify diet, exercise, salt and sodium intake, and medication adherence to impact BP management.

The pre HTN knowledge test was administered prior to the first education session and a post-test was administered after the second education session in week two. Participants also received printed informational material to take home. The materials, available on the AHA website and some purchased, focused on healthy lifestyle behaviors to manage BP and aligned with the educational modules to further enhance parishioners' knowledge.

### **Study Setting**

A large suburban Lutheran church was selected to implement this evidence-based project. The church currently has over 600 members, sees about 20-30 visitors a month, and serves a



predominantly white population. It is located in an affluent neighborhood that boasts many healthy food stores, gyms, as well as walking and bike paths. A large number of parishioners are over age 50 and many have chronic conditions, HTN being one of them. The church is a setting where parishioners feel comfortable, is family oriented, and has 30 small group ministries that brings together about 200 members for routine gatherings which involve prayers, meal sharing, and other fun activities, thus, this setting was ideal to evaluate the effectiveness of an education intervention to improve knowledge, modify lifestyle behaviors and decreased BP among parishioners.

### **Study Population**

Participants were recruited from the congregation through a three-week screening/enrollment process after GWU's Institutional Review Board (IRB) determination. The population selected for this study included English speaking adults ages 40 years and older with a self-report diagnosis of HTN, or a BP of 130/80 or greater at screening, or currently taking BP medication(s). A diagnosis of HTN was defined by the following criteria: (1) a history of being told by their physician that they have HTN, (2) currently taking medications to treat HTN, or (3) documentation of BP reading of 130/80 or greater by study staff using standardized methods of BP measurement (Shapira, et al., 2012). Adults whose BP could not be measured in either arm using standardized methods of BP measurement due to a medical contraindication such as bilateral lymphoedema were excluded (Darrat, et al, 2018). Adults with cognitive impairments were also excluded. A convenience sample of participants was used for this project. Assuming a moderate effect determined by statistical power analysis, with a power of 80% and alpha of 0.05, a sample size of 31 participants was targeted. Assuming a dropout rate of 20% at follow-up, a

minimum of 39 participants was needed. 44 parishioners were recruited, 8 dropped out and 36 completed the study.

### **Subject Recruitment**

After IRB determination was obtained, advertisement and recruitment of subjects took place over a three-week period. An informational flyer was created by the DNP student and was posted on bulletins boards around the church, in the associated Kindergarten school attached to the church, and on the church's website and social media platforms. A copy of this flyer is presented in Appendix D. Additionally, announcements were made by the Senior Pastors at all three worship services on Sundays and by small group ministry leaders at their gatherings or by email during the recruitment period. Screening sessions and enrollment were held mostly on Sundays but also at small groups during the week to accommodate as many parishioners as possible. Once screened, those that were eligible and willing to participate in the program were asked to fill out a demographic survey and had their baseline BP measured.

### **Ethical Considerations**

This educational intervention sought the approval of the GWU's IRB. Additionally, since the project site does not have its own IRB, an agreement with the project site to conduct the study was obtained and is presented in Appendix E. Participation was strictly voluntary and participants were able drop out anytime they wished to without being pressured or penalty from the church. Consent was assumed with participation in the program. Privacy was provided for the participants at all times during recruitment and data collection. There were no anticipated risks or harm to participants in this study. No participants experienced any emotional discomfort if their BP was high. There were no cost or compensation to study participants. Participants were given

the DNP student's contact information (phone number and email) in case they had questions or concerns.

The study utilized surveys and BP measurements to collect participants' data. To protect the confidentiality and identification of participants, each participant was assigned a participant code which was written on a card and given to the participant to keep, and was instructed to write the code on all data collection surveys. When collecting BP data, the study staff asked the participant for their study code and it was entered with their data collection sheets. On a separate document, with access restricted only to the DNP student, each participants' names, phone numbers, and emails and unique study codes were listed and stored separately from data documents in the DNP's student's password protected personal computer at home. Data was cleaned, verified for accuracy and entered into Excel and SPSS for storage and data analysis. All de-identified data will be stored for six years as required by the study requirements.

### **Outcomes**

***HTN knowledge:*** Defined as scores obtained on a HTN knowledge test which was measured using a self-administered modified HELM questionnaire containing 14 items (Shapira, et al., 2012). This tool has been shown to be valid and reliable in assessing participants' knowledge of HTN to manage their chronic disease (Ihwanudin, et al., (2015); Shapira, et al., 2012). An increase in HTN knowledge score from baseline to post intervention was an anticipated finding for this study.

***Lifestyle Behavior Change:*** Weight gain, physical inactivity, and high salt intake are associated with inadequate BP control according to a retrospective study on hypertensive patients (Yang, et al., 2017). Physical activity level (walking, running, strength training, and/or gardening) watching or reducing salt and sodium were the two lifestyle behavior changes

selected as outcomes measured in this study. Weight gain was not measured given the short duration time of our study. An increase in number of minutes parishioners exercised per week from baseline and increase in number of days parishioners reduce their salt/sodium intake from baseline were anticipated findings. These lifestyle behaviors were measured using self-reported data.

**BP:** As described by the AHA and ACC, normal BP is defined as a SBP of 120 mmHg and a DBP of 80 mmHg while HTN is defined as a SBP of 130 mmHg or higher and/or a DBP 80 mmHg or higher (Whelton, et al., 2018). BP was measured in both arms using a standardized method with an automated BP monitor and the average of the two readings was documented (Darrat, et al., 2018). A decrease in SBP and/or DBP from baseline to two-weeks post intervention was an anticipated finding for this study. BP measurements data were obtained three times during this study: pre intervention, post intervention, and two weeks post intervention follow-up. The Omron 10 Series BP monitoring device was used to obtain BP data and calibration was ensured prior to use according to the manufacture's manual. To ensure inter-rater reliability for obtaining BP measurements, study staff was required to attend a one-hour training given by the DNP student and successfully completed a BP competency demonstration (Williams, et al., 2009). Appendix F shows a copy of the BP Measurement Competency.

### **Study Tools**

HTN knowledge is a vital part of the patient's self-care model and is a critical preventive strategy to help patients manage this chronic disease and a known barrier for HTN control. The 14 item HELM scale used in this study to assess HTN knowledge was developed by Schapira, et. al., (2012) as part of a community-based study designed to improve self-management of HTN addresses three domains of BP management understanding: monitoring and setting goals,

lifestyle and medication management, and general HTN knowledge and treatment goals regarding HTN. It aimed to measure a patient's readiness to begin self-management of their HTN and to accurately measure knowledge of HTN, in the context of managing it as a chronic disease (Schapira, et al., 2012). Validity of the HELM questionnaire "was assessed through comparisons of performance with education, health numeracy, patient self-efficacy, and hypertension control" and was successful in providing a valid measure of knowledge needed for patients to proactively manage their HTN (Schapira, et al., 2012, p. 461). The instrument has good internal reliability with Cronbach's alpha .89 (Ikwanudin, et al., 2015). Darrat, et al., (2018) used the HELM tool in a prospective cohort randomized study to assess a patients' HTN educational intervention and BP control in a community setting. Results show that there were significant improvements in HTN knowledge and BP measurements among participants in the intervention group compared to control group (Darrat, et al., 2018). Thus, the HELM tool appears to be a valid and reliable tool that can be used to measure knowledge of HTN in the context of chronic disease management and is easily accessible for public use via the internet. While the tool has no copyright because it was created with federally funded research, permission for use in this project was still obtained from the authors. A copy of the permission obtained is presented in Appendix G. Demographic and lifestyle behaviors questions were extracted and modified for use in this study from the CDC's 2015 Behavioral Risk Factor Surveillance System Questionnaire (BRFSS) (CDC, 2014). A copy of all the HELM scale and the BRFSS questionnaire study tools are presented in Appendix H as Study Tools.

**Project Timeline**

- *Phase I (January, 2019):* DNP student met with stakeholders from the project site to assess needs of the organization and identified a topic for the DNP Project. Stakeholder buy in was sought and a project team was formed.
- *Phase II (February through May, 2019):* A letter of agreement was obtained from study site. The DNP student worked under the guidance of the project team which includes the primary advisor to write the DNP proposal and obtained approval for the project. A secondary advisor was also identified in this phase.
- *Phase III (June-August, 2019):* The proposal was submitted to GWU IRB for review and approval was obtained. The DNP student worked to develop the educational intervention.
- *Phase IV (September through December, 2019):* Participants were recruited, the project was implemented and results were analyzed.
- *Phase V (January to March, 2020):* Evaluation of the DNP project outcomes was completed along with abstract writing and poster development.
- *Phase VI (March through April, 2020):* Final DNP report was completed and results were disseminated to the project team.

Appendix I outlines these activities in a Gantt Chart as Project Timeline.

**Resources Needed/Study Expenses**

Strong leadership commitment, support and buy-in from the project site leaders were critical to the successful implementation and completion of this evidence-based change project (Moran, Burson & Conrad, 2017). Assistance from the project team was important for planning and carrying out activities throughout the recruitment and implementation phases. Space for educational sessions was also provided by the church. Advanced technology played a key role in

this project as educational sessions were conducted with a power point presentation, which warrants a screen and laptop. The church's IT specialist was responsible for setting up the classroom with the necessary audiovisual equipment. Additionally, the DNP student utilized software on her password protected computer such as Microsoft Word and Excel, SPSS for data analysis and evaluation, and writing the final report of the project. Email was used to reach team members and participants when necessary with the help of the church's administrative assistant and all participants were given the DNP student's personal cell phone number to reach her in the event that something comes up and they cannot attend a session. Healthy meals were offered to participants and team members at each session. Four BP monitoring devices were purchased to collect BP data. A \$250 grant was provided by the Trivent Action Team via the project site, the DNP student absorbed most of the cost incurred by this study which included BP monitoring devices, take home materials, materials and supplies, healthy food and refreshments, and thank you gift cards for study staff.

### **Evaluation Plan**

Identifying the appropriate evaluation methodologies, techniques, and tools to consistently measure the usefulness, effectiveness, and impact of an educational intervention to improve HTN knowledge and BP control was a focus for this project. This one-year DNP project set the following goals: increase HTN knowledge among participants, change lifestyle behaviors to decrease salt intake and increase exercise, and improve BP control. The long-term impact is expected to raise public awareness of strategies to control HTN, inform nurse leaders, and serve as a catalyst for implementing health promotion programs within the faith communities to help parishioners control detrimental lifestyle habits to manage their HTN and other chronic disease. The intermediate impact is to modify lifestyle behaviors to better management of BP, and the

short-term impact is to increase knowledge and awareness of the risk factors associated with this chronic disease and strategies to better manage it. The Logic Model as described earlier in this paper guided the evaluation plan. The following questions were addressed in this evaluation:

- To what extent are the goals of the overall program being met?
- What resources and support are required at the organizational level in order to effectively carry out this project and for it to be sustainable?
- Are stakeholders successfully involved?
- What are the identified barriers to implementation?
- Is the intervention successfully implemented as planned?

The evaluation matrix for this project is displayed in Appendix J. The results of this evaluation identified lessons learned that can be applied to other educational intervention in establishing a health promotion program within the faith-based setting.

### **Data Analysis**

Data was analyzed using Microsoft Excel and Statistical Package for Social Sciences (SPSS). Descriptive statistics were performed to examine participants' characteristics and distribution of study variables. Paired t-test and repeated measures analysis of variance (RM-ANOVA) were used to address the three study questions: 1) Does providing education on HTN increase HTN knowledge score among participants? 2) Does HTN knowledge aid in improving lifestyle behaviors? and 3) Does increasing knowledge and changing lifestyle behaviors decrease SBP and DBP? For all analysis, alpha is set at 0.05.

### **Results**

A total of 87 participants were screened over a three-week period, 56 of whom met the eligibility criteria for inclusion in the study, and 44 of these were enrolled. Of the 44 participants



enrolled in the study, 36 completed the study. Four participants changed their minds due to personal and time-conflict, two participants could not make it on the day intervention was started so did not receive any intervention, and two participants attended one class each and received only partial intervention and were considered dropouts. Data was collected from the 36 participants who completed the study and were used in this data analysis.

#### *Demographics and Characteristics of Study Population*

The characteristics, average baseline BP pressure measurements and baseline lifestyle behaviors of the study population are summarized in **Table 1**. Participants were 53% male; 33% were below age 60, 25% ranged from ages 60-69, but most (42%) were ages 70 and over. Participants were predominantly white, had college or higher education, and did not smoke. 75% (27) of the participants reported a history of HBP, 9 of which reported having HBP for less than 5 years and 18 reported having HBP for 5 or more years, and 25 reported currently taking BP medications. The other two had reported that they stopped using their medication. Less than half of the participants (44%) reported that they exercised regularly. The 14 item HELM scale to measure HTN knowledge was administered to all 36 participants prior to receiving the intervention and showed a pre intervention mean score of 9.78. At baseline, participants had a mean SBP was 139.1 and mean DBP of 84.25. Additionally, prior to receiving the intervention, participants reported a mean average minutes exercised per week was 123.23 and more than half of them (55.6%) reported that they were watching or reducing their also intake.

#### *HTN Knowledge Score*

Pre and post knowledge scores were computed using paired t-test. Before the intervention, participants scored a mean average of 9.78 on the HELM scale while post intervention, participants increased their mean score to 13.61. This increase in knowledge score

was statistically significant ( $t=11.15$ ,  $p<0.001$ ). These results are summarized in **Table 2** and charted in **Figure1**.

### *Lifestyle Behaviors*

Two lifestyle behavior measures, exercise and salt/sodium intake, were chosen as a focus for changing behaviors in this study and were analyzed using data from pre and post intervention. Only 33 participants answered these questions. Results using paired t-test and McNemar tests are summarized in **Table 3** and charted in **Figure 2**.

*Physical Activity:* Prior to the intervention, 28 (77.8%) participants indicated that they had exercised in the past two weeks compared to 34 (94.4%) post intervention, and 16 (44.4%) of those participants reported that they exercised for 150 minutes or more per week compared 23 (68.9%). These differences were not statistically significant ( $p=0.07$  and  $p=0.092$  respectively). However, the average number of minutes participants exercised per week pre and post intervention increased from 123 minutes to 167 minutes, and was significant ( $t=2.40$ ,  $p=0.023$ ).

*Salt Intake:* Participants were asked whether they were watching or reducing their salt/sodium intake, if so, how many days they were doing so. Prior to the intervention, 19 (57.6%) participants stated they were currently watching or reducing their salt/sodium intake compared to 28 (84.8%) at post intervention. This comparison showed a significant increase from pre to post intervention ( $p=0.012$ ). We did not compare the number of days reducing salt/sodium intake because at the screening, only 14 participants reported number of days, while after the intervention, 28 participants reported on this variable.

### *BP Pressure Changes*

To determine whether there was a difference in average SBP and average DBP of participants before, immediately after, and at two weeks follow-up after the HTN educational

intervention, repeated measures analysis of variance (RM-ANOVA) were performed. The mean average SBP decreased from baseline to follow-up which was statistically significant ( $m139.1 - 132.4$  mmHg,  $F=4.37$ ,  $p=0.016$ ) while the mean DBP showed no difference. These results are summarized in **Table 4** and charted in **Figure 3**). Additionally, paired t-tests were performed to further compare pre to post systolic BP, pre to 2-week follow-up, and then post to 2-week follow-up and summarized in **Table 5**. There was significant decrease in average SBP from pre to post and pre to 2-week follow-up. Post to follow-up average SBP did not show a significant difference. All tables and figures are displayed in the Results Tables and Figures section of this paper.

### Discussion

The results of this study indicated that the educational intervention was highly effective in helping to manage BP. We observed significant increase in HTN knowledge score and physical activity level, reduction in salt/sodium intake, and decrease in SBP. The change in SBP was not significant. Our findings are consistent with previous studies that reported increased post-test scores for HTN knowledge from baseline scores with favorable impact on lifestyle behaviors and BP control after a tailored HTN educational intervention (Abu et al., 2018; Beigi, et al., 2014; Darrat et al., 2018; Park, et al., 2010). Further, the interactive nature in the delivery of this intervention to participants is consistent with findings published by Lu, et al. (2015) suggesting that interactive education intervention may be the most effective strategy in community-based health promotion education programs for hypertensive patients in improving their HTN knowledge and mitigating clinical risk factors for preventing HTN-related complications.

Khatib et al. (2014) and Heinert et al. (2020) have found that lack of HTN education is the most common barrier to HTN control. Our study findings reflected these findings and suggested that providing an interactive educational intervention and engaging parishioners in modifying their lifestyle behaviors to impact BP control is a multifaceted approach when targeting the need of hypertensive patient and moves our progress in closing this gap in practice. An additional finding that deserved mentioning is that during the recruitment phase of this project, we found that 56 of the 87 (64%) participants screened met inclusion criteria for the study, meaning that their either had HTN or was hypertensive at time of screening. This “uncontrolled hypertension” for this congregation is almost consistent with CDC’s data that 76% of American adults do not have their BP under controlled.

Our study findings gave insight into the practicality of healthcare professionals collaborating with faith-based leaders to provide education in faith-based settings that would impact lifestyle behavior changes which Cooper & Zimmerman (2017) and Schoenthaler, et al. (2020) found to be key in controlling BP and achieving improved health outcomes for parishioners in faith communities. It can also foster an environment of sustained support to impact parishioners’ overall health. Buy-in and support from stakeholders as well as empowerment through knowledge to improve disease management is fundamental for sustainability of these health promotion programs, serves as a catalyst for spread into the community to reduce risks of life-threatening conditions, decreases healthcare costs, and supports population health beyond clinical walls.

### **Study Limitations**

While this study produced some important results and met most of its objectives, there were some potential limitations that must be considered. First, as the recruitment of this study

took place at screening events at a church, participants without a self-report HTN diagnosis were recruited on the basis of having a HBP on that day which may have led to “white coat syndrome” and overestimate the true prevalence of high BP (Darrat, et al. 2018). Second, information on physical activity and salt/sodium intake were collected through participants’ self-reports which could have resulted in potential recall bias and social desirability bias (Abu, 2018). Third, times of data collection for BP measurements did not take into consideration parishioner’s times of medication schedule. This could have potentially affected baseline BP readings and skew comparison results with post intervention measurements. Fourth, the short study period of four weeks made it difficult to determine whether the knowledge gained from the intervention was consistent with lifestyle behaviors and BP changes, thus, longer term studies are needed. Fifth, the two studies used in this project to support reliability and validity of the HELM scale targeted low income and low literacy populations and may not be generalized to other populations such as our college educated population. Additionally, there may be some unmeasured confounding factors not accounted for in this study. Participants’ motivation, either by faith leaders to help with the study or simply to improve lifestyle practices, and the fact that our study population was from a suburban high-income community and had access to healthy food stores, gyms, and walking and biking trails may have influenced the association between HTN knowledge and improved lifestyle behaviors and its impact on BP control.

### **Implications/Recommendations for Practice, Policy and Research**

The prevalence of HTN in the United States is astounding with too many Americans being affected. While recommended evidence-based interventions are in place to help manage the disease, progress has been slow. Nurse leaders are well positioned to use evidence-based interventions to help move the goals towards control and prevention. HTN education to improve

knowledge and lifestyle behaviors to help control BP has been identified in the literature as a barrier to effective management of HTN. The results of this study have clinical implications for hypertensive patient management and population health. Understanding this gap in practice with disease management and recommended evidence-based interventions to help close these gaps can inform areas of success for nurse leaders and the need to improve community-based HTN programs including any future implementation of our HTN program in the faith community. We, therefore, recommend providing well-designed educational programs that are interactive, tailored and grounded in theory to the needs of parishioners to change lifestyle practices and improve management of HTN and other chronic conditions on an ongoing basis in faith communities. Effective HTN management also has significant financial implications. The ability to improve the transition of care to the community settings as supported in the literature requires evidenced-based interventions that will facilitate self-care for HTN management, reduction of risk factors and morbidity and mortality HTN rates, all of which can favorably impact hospital re-admission rates for uncontrolled HTN and thus, decrease health care expenses.

This project was conducted over a four-week period and, therefore, produced short-term results. We recommend further research to determine any long-term impact of HTN education on lifestyle behaviors and HTN management as this evidence-based intervention have massive potential to serve as a catalyst for community spread.

Support for Health Ministries within faith-based settings to engage parishioners and promote health is not only recommended but critical to reaching at-risk populations in this community. Faith-based settings should develop a policy to support Parish Nurses in established Faith Health Ministry Programs where they have a crucial role in the faith communities to make key decisions and partner with community resources to improve the quality of life to facilitate

parishioners spiritual, emotional, and social health. An established Faith Health Ministry Program overseen by a paid Parish Nurse in this setting can provide opportunities for collaboration between faith communities, county health departments, hospitals and clinics to provide preventive screenings on BP, diabetes, cholesterol, etc., as well as addressing issues with disease management similar to this project. This keen collaboration is critical to engaging and fostering faith community participation in HTN management to reduce HTN risk factors, morbidity and mortality. Engaging high-risk populations in settings where they dwell and feel comfortable can move our progress towards promoting healthier behaviors to better manage uncontrolled HTN.

### **Plans for Sustainability and Future Scholarship**

Too many parishioners at this project site are affected by HTN and an alarming number of them do not have their BP under control which puts them at increased risk for life threatening events. Our study found that utilizing a tailored and interactive educational intervention was highly effective in increasing parishioners' HTN knowledge, favorably changed their lifestyle behaviors, and decrease their SBP. These results were disseminated to the DNP Project team at both GWU and the project site with additional plans to disseminate at local, regional, and national public health conferences. The faith leaders and the parishioners at this project site are highly supportive of sustaining this program given our findings. This was the first time that this kind of project was conducted there.

While further research is needed to examine long-term impact of education on lifestyle behaviors and HTN management, the success of this DNP project helped lay the ground work for sustainability of a Faith Health Ministry program in the church with oversight by a part-time volunteer Parish Nurse. The Parish Nurse and lead project Pastor were both very involved with the study and actually got good insight on the importance of sustainability. The program

evaluation conducted by the DNP student at the end of the project indicated that parishioners want to see more projects like this conducted in the church with focus on health prevention, screenings, and disease management. There are plans for collaboration with the local hospital and health department to provide quarterly screenings at the church as well as inviting local health experts to address chronic diseases and management via educational in-person sessions. As a result of the study, parishioners are now more aware of their BP measurements and are showing an increased interest in attending BP screenings. To stay on course with the plan for quarterly BP screenings, another successful BP screening event was held at the church three months post-intervention where 48 parishioners were screened, including a few of the participants who wanted to get their BP rechecked. We are making progress already with this health ministry in place. Importantly, additional finances were included in the church's budget to enhance health promotion activities and discussions regarding the recruitment of a paid full-time Parish nurse to oversee this Ministry on a broader level will take place in the future. The success of this program, enhanced with additional long-term studies, can serve as a catalyst for spread into the community.

### **Conclusion**

Overall, the study findings provided evidence for the effectiveness of providing an evidence-based interactive educational intervention for adult parishioners in the faith-based community and validated the importance of utilizing recommended best practices to help reduce risk factors associated with uncontrolled HTN. Further research is needed to evaluate the long-term impact of education on reducing risk factors, mortality and morbidity for the hypertensive population.

BP control is critical to avoid the devastating risks of strokes, heart disease, and kidney disease and failure. The increasing demand to provide education beyond the clinical wall and



into community settings is important for the management of BP and reducing its life-threatening risks. Lack of HTN knowledge to promote and encourage lifestyle behavior change can negatively impact the efforts of BP control and quality of life for parishioners and community residents in general. Providing an interactive, tailored, and evidence-based educational program that is grounded in theory is highly effective and recommended to target the needs of the faith community. It changes lifestyle behaviors to favorably impact disease management, works to help close the gap in practice, fosters an environment of sustained support to engage parishioners, enhances collaboration across healthcare and community leaders, and can serve as a catalyst for spread into the community.

Additionally, it provided an opportunity for a collaborative partnership across health care and faith communities to improve health outcomes for the population which Campbell et al. (2007) states is essential for program design, recruitment, and sustainability of church-based health programs. Merai, et al, (2016) states that these collaborative and coordinated efforts are required to leverage the strengths and resources of both public health and health care systems. This evidence-based project also supported the goals of AHA, ACC, Healthy People 2020, Million Hearts Initiative, the CDC, and the WHO and aligns with the Institute of Medicine's triple aim of improving patient care experience, improving health populations and reducing health care costs. Effective HTN management in a faith community can help to improve outcomes for individuals and populations and reducing healthcare costs.

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## Results Tables and Charts

**Table 1: Demographics and Characteristics of the Study Population**

		<b>Total Sample (N=36)</b>
<b>Variable</b>	<b>Category</b>	<b>Frequency (%)</b>
Gender	• Male	19 (52.8%)
	• Female	17 (47.2%)
Age	• <60 years	12 (33.3%)
	• 60 – 69 years	9 (25.0%)
	• 70 plus years	15 (41.7%)
Race/Ethnicity	• White/European American	33 (91.7%)
	• Other	3 (8.3%)
	• High school or GED	4 (11.1%)
History of HBP	• Yes	27 (75.0%)
	• No	9 (25.0%)
Length of HBP History	• < 5 years	9 (33.3%)
	• > 5 years	18 (66.7%)
BP Medication	• Yes	25 (69.4%)
	• No	11 (30.6%)
Smoke	• Yes	2 (5.6%)
	• No	34 (94.4%)
Exercise Regularly	• Yes	16 (44.4%)
	• No	20 (55.6%)
Pre-intervention HTN Knowledge Mean Score		9.78 (SD 1.972)
Pre-intervention BP Mean	• Pre-Mean SBP	139.1 (SD 15.07)
	• Pre-Mean DBP	84.25 (SD 11.89)
Pre- intervention Lifestyle behavior	• Average minutes of exercise per week	123.23
	• Watching/reducing salt intake	20 (55.6%)
	- Yes	15 (41.7%)
	- No	1 (2.8%)
	- Don't know/not sure	

Values are expressed as frequency and percentage, and means and SD are reported where applicable.

**Table 2: Knowledge Score (n=36)**

	Pre-intervention M(SD)	Post-intervention M(SD)	Statistics, p value
HTN Knowledge	9.78 (1.97)	13.61 (0.77)	<b>t=11.15, p&lt;0.001 Significant</b>

Paired t-test was used to compute pre and post means. Significant results are bolded.

**Table 3: Lifestyle behaviors pre and post the intervention (n=33)**

	Pre	Post	Statistics, p value
Have you exercised • Yes • No	28 (77.8%) 8 (22.2%)	34 (94.4%) 2 (5.6%)	p**=0.07 Not significant
Have you exercised 150+ minutes • Yes • No	16 (44.4%) 20 (55.6%)	23 (68.9%) 13 (36.1%)	P**=0.092 Not significant
Average number of minutes exercised per week	123.23(SD 125.11)	167.10 (SD 126.45)	<b>t*=2.40, p**=0.023 Significant</b>
Watching or reducing sodium • Yes • No	19 (57.6%) 14 (42.4%)	28 (84.8%) 5 (15.2 %)	<b>P**=0.012 Significant</b>
Number of days reducing sodium per week			NA

t\* paired t-test and P\*\* McNemar tests were used to compare pre and post lifestyle behaviors. Significant results are bolded.

**Table 4: Changes in Blood Pressure Measurements (n=36)**

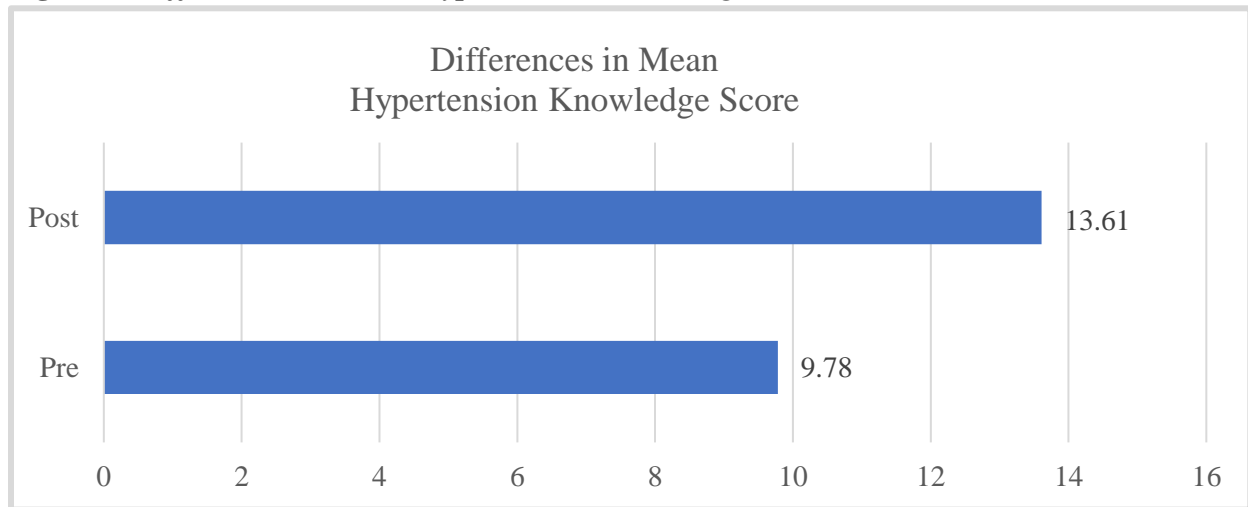
Measure	Pre	Post	2-week Follow-up	Statistics, p value
SBP	139.11	133.35	132.40	<b>F*=4.37, p=0.016 Significant</b>
DBP	84.25	82.26	81.90	F*=1.55, p=0.220 Not Significant

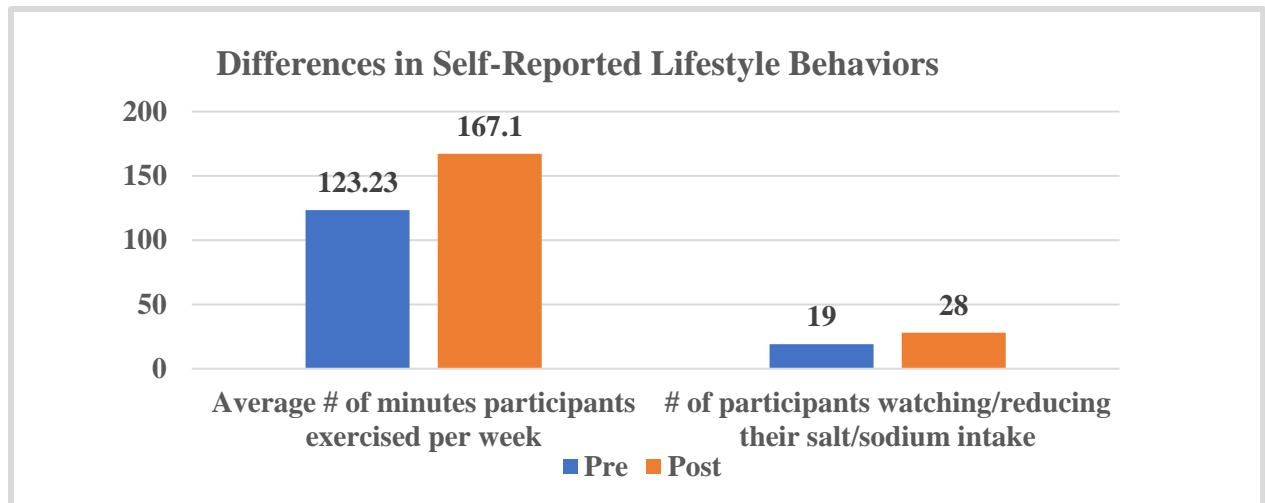
Repeated measures ANOVA was used to compare the three BP measurements. Significant results are bolded.

**Table 5: Pairwise Comparison for SBP (n=36)**

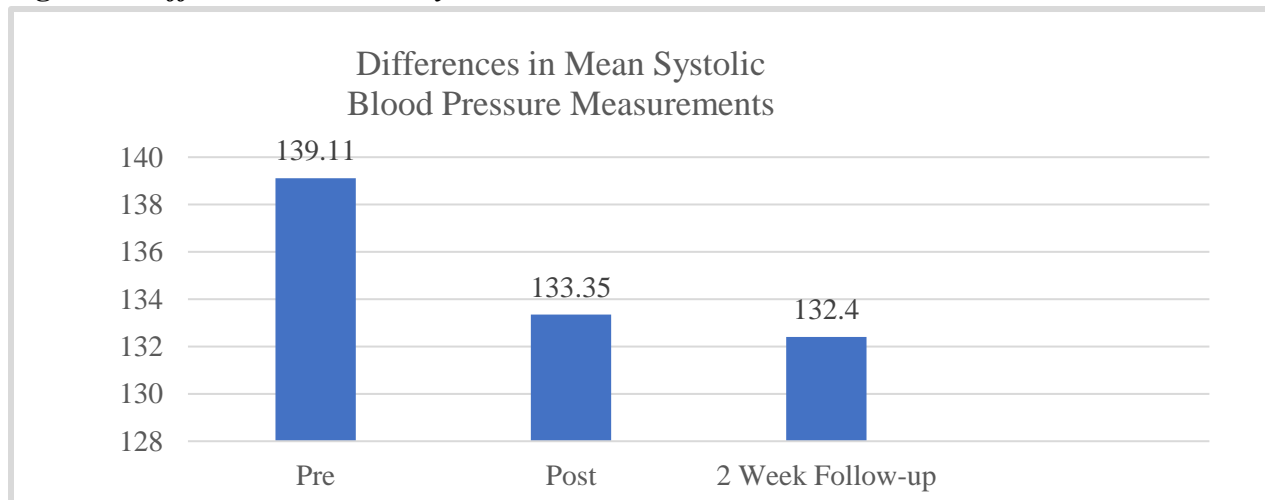
Variable	Statistics, p value
Pre vs. post	<b>t=2.46, p=0.019 (significant)</b>
Pre vs. 2-week follow-up	<b>t=2.44, p=0.020 (significant)</b>
Post vs. 2-week follow-up	t=0.42, p=0.678 (not significant)

Paired t-tests were used to compare BP measurements. Significant results are bolded.

**Figure 1: Differences in Mean Hypertension Knowledge Score****Figure 2: Differences in Self-Reported Lifestyle Behaviors**



**Figure 3: Differences in Mean Systolic Blood Pressure Measurements**



## Appendices

### Appendix A - SWOT Analysis

Problem: Lack of a Health Promotion Program

	<b>Helpful</b> <b>To achieving the objective</b>	<b>Harmful</b> <b>To achieving the objective</b>
<b>Internal Origin</b> {Attributes of the organization}	<b>Strengths</b> -Supportive leadership -Parish nurse -Large modern church facilities -Advanced technology -Administrative staff onsite -Adequate parking -Updated website -Active engagement in community	<b>Weaknesses</b> -Small groups offered at different times -Pastors and Parish nurse do not have set office hours -Staff in volunteer positions -Parish nurse is part time
<b>External Origin</b> {Attributes of the organization}	<b>Opportunities</b> -Collaboration with local hospital, health department and other community stakeholders -Funding initiatives to develop evidence-based faith-based or faith-placed health interventions	<b>Threats</b> -Affluent status of community so may not be interested in community education -Lack of engagement of parishioners -Parish nurse is part time volunteer

**Appendix B - Literature Review Table**

**PICO Question:** What is the effect of an educational intervention, compared to the baseline, on HTN knowledge, lifestyle behavior modifications and BP control among parishioners ages 40 and older at a suburban community church?

Article #	Author & Date	Evidence Type	Sample, Sample Size, Setting	Study findings that help answer the EBP Question	Observable Measures	Limitations	Evidence Level & Quality
#1	Abu, et al., 2018	Cross-sectional survey	385 adults with HTN treated in 2 primary care clinics	Increased HTN knowledge was associated with healthy lifestyle practices such as dietary salt intake and eating less to reduce weight.	Hypertension knowledge and self-reports on dietary changes, exercise, and medication adherence.	-Re-call bias and social desirability bias with self-reports of lifestyle practices  - Selection bias with patients who have seen their doctors during study period and may be more knowledge about HTN.	Level III  Quality A/B
#2	Bangurah, et al., 2017	Pre-post design	16 Black adults 55 years and older in a faith-based setting	Significant decrease in dietary sodium and increase in physical activity level from pre to post intervention.	-Dietary sodium intake and physical activity levels  - BP readings	-Sample size (16)  -Gender (75% female) and racial (100% Blacks) bias limited generalizability of study  -Participant bias due to self-reported	Level III  Quality B

				-BP control improved but changes were not significant.		data which can threaten external validity.	
#3	Baruth, et al., 2015	Qualitative	24 faith leaders in 2 geographic regions	Capitalizing on the strengths of and engaging faith leaders in health promotion efforts can be beneficial to improving disease management in the faith community.	<ul style="list-style-type: none"> <li>- Perception</li> <li>-Attitudes</li> <li>- Beliefs</li> <li>-Experiences</li> <li>- Influence of faith leaders on their congregation.</li> </ul>	<ul style="list-style-type: none"> <li>- Participant bias with qualitative study design</li> <li>- Sample was from 2 specific geographic areas and does not represent other regions in county, thus limiting generalizability</li> </ul>	Level III Quality A/B
#4	Beigi, et al., 2014	Quasi-experimental	110 hypertensive patients in a heart health center.	A short-term educational HTN program was effective in increasing knowledge,	<ul style="list-style-type: none"> <li>- Knowledge scores</li> <li>- Lifestyle behaviors</li> </ul>	<ul style="list-style-type: none"> <li>- Small sample size</li> <li>- Short follow-up</li> </ul>	Level II Quality A/B



				improving self-management, and BP control	- BP control	-Lack of special emphasis on smoking	
#5	Cooper & Zimmerman, 2017	One group pre-post study	109 hypertensive parishioners in a faith community	39 faith nurses offered 3-month BP monitoring and coaching intervention over a 2 -year period. Participants showed decreased BP readings and improved lifestyle satisfaction scores in six out of seven areas across the 2-year study period	- BP measurements  -Lifestyle satisfaction scores (BP self-monitoring, healthy activity, healthy weight, managing medications, healthy eating, managing stress, tobacco use)	-No comparison group which limits generalizability  -Limited consistent data showing effect on participants being referred to provider.  -Demographic data was severely under collected since gender was the only demographic data collected.  -The FCNs who collected the data were willing volunteers.	Level III  Quality A/B
#6	Darrat et al., 2018	Quasi-experimental design with two groups with pre- and post-test	118 hypertensive participants recruited from a Stroke center. 59 participants were randomized to	After a 4-week study period, significant improvements in HTN knowledge and awareness, exercise levels, weight and reduction in	- Hypertension knowledge and awareness  -Weight  -Exercise level  -BP measurements	- Participants were recruited on the basis of having high BP on that day which may have led to the recruitment of participants with “white coat syndrome” and	Level II  Quality A/B

			intervention group and received a HTN educational intervention and 59 to control group received usual care. The response rate was 69%.	both SBP and DBP were found, indicating that providing tailored educational intervention can positively impact on HTN knowledge, self-care management and BP control in within community-based settings.		could overestimate the true prevalence of high BP.  -Recall bias and social desirability bias with self-reported data on lifestyle behaviors  -Small sample size  -Short term intervention and follow-up phase	
#7	Ihwanudin, et al., 2015	Quasi-experimental with two groups, pre and post-test design.	58 elderly recruited randomly from two health care center and assigned to two equal groups.  Intervention group received a theory-based lifestyle medication program while control group	There was a significant difference in all variable in the intervention group compared to the control group.  HELM scale was tested and found to have good internal reliability with Chronbach's alpha .89	-Mean knowledge score  -Situational perception  -Blood pressure  -Cholesterol	-Given the advanced ages of participants, continuous follow-up may not be sustainable.  -Gender bias since most participants were female.	Level II  Quality A/B

			received usual care.				
#8	Heinert, et al., 2020	Qualitative	31 community members were recruited from 4 church-based settings in minority neighborhoods. 4 focus groups took place in these 4 churches.	After receiving screening, brief intervention and referral to treatment program for hypertension, participants were able to identify the most common barriers to HTN control being lack of HTN knowledge and awareness, and negative primary care experiences while most common facilitators were HTN control with social support, knowing how to control HTN, and community resources at 3	<ul style="list-style-type: none"> <li>- Knowledge of barriers to HTN control</li> <li>- Knowledge of barriers and facilitators for HTN control</li> </ul>	<ul style="list-style-type: none"> <li>-Convenient sample so maybe not representative of generalized population.</li> <li>-Intercoder reliability was not calculated so cannot quantify reliability of coding across multiple coders.</li> </ul>	Level III Quality A/B

				months post intervention.			
#9	Khatib, et al., 2014	Systematic Review and Meta Analysis	44 quantitative and 25 qualitative studies	Lack of knowledge was the most common barrier to HTN control and awareness and the need for targeted multi-faceted interventions to manage HTN.	<ul style="list-style-type: none"> <li>- Barriers reported by HTN patients</li> <li>-Barriers reported by population groups at risk for HTN.</li> </ul>	<ul style="list-style-type: none"> <li>- studies were heterogeneous in terms of study population and setting, and barrier assessment methods and tools.</li> <li>-Modest methodological quality of both quantitative and qualitative studies.</li> <li>-Majority of studies conducted in higher income countries, mainly in the USA, so not generalizable to countries with different socioeconomic status.</li> </ul>	Level III Quality A/B
#10	Lu, et al., 2015	Randomized, non-blinded trial	360 hypertensive patients in a community health service center over a 2-year study	Interactive education workgroups was the most effective strategy in community-	<ul style="list-style-type: none"> <li>- Hypertension score</li> <li>- Adherence to medication</li> <li>- Salt intake</li> </ul>	<ul style="list-style-type: none"> <li>- Trial was not blinded to participants</li> <li>-Data on lifestyle behaviors was self-</li> </ul>	Level 1 Quality B

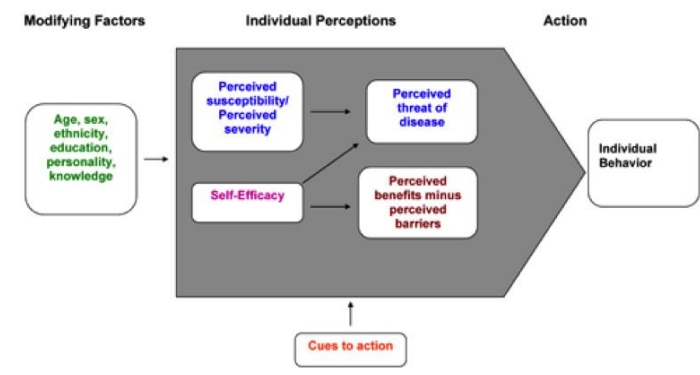
			<p>period. Participants were randomized in 3 groups:</p> <p>Group 1 received self-learning reading;</p> <p>Group 2 received monthly regular didactic lectures; and</p> <p>Group 3 received monthly interactive education workshops</p>	<p>based health promotion education program for HTN patients in improving patient's knowledge on HTN and reducing risk factors.</p>	<p>- Physical activity</p> <p>- BMI</p> <p>-Cholesterol</p>	<p>reported which presents recall bias.</p>	
#11	Ozoemena, et al., 2019	Quasi-experimental	<p>400 hypertensive retirees in 2 cities in Nigeria</p> <p>Intervention group received HTN health education.</p>	<p>Mean HTN knowledge score and lifestyle behaviors significantly increased in the intervention group compared to the control group between baseline and</p>	<p>-HTN knowledge score</p> <p>-Prevention</p> <p>-Self-care practices</p>	<p>-External factors unconnected to interventions</p> <p>-Small sample size making confounding factors a bias</p>	<p>Level II</p> <p>Quality A/B</p>

			Control group received health talks without intervention	one-month follow-up.			
#12	Park, et al., 2010	Randomized controlled trial	<p>Older hypertensive patients</p> <p>18 allocated to the intervention group to receive health education, individual counseling, and tailored exercise program</p> <p>22 allocated to control group and did not receive any intervention.</p>	After the 12-week study period, systolic BP in intervention group was significantly decreased, and scores for exercise, self-efficacy and behavior, and health related quality of life were statistically higher compared to the control group.	<p>-self-behavior</p> <p>-self-efficacy for exercise</p> <p>-physical activity</p> <p>-health-related quality of life</p> <p>-BP readings</p>	<p>- short study period of 12 weeks</p> <p>-older adults who had an interest in the program were included in the study so motivation level may have been higher.</p>	Level I Quality B
#13	Schoenthaler, et al., 2018	2-arm cluster randomized control trial	<p>373 black participants in 32 churches.</p> <p>Intervention group received therapeutic lifestyle</p>	The Motivational interviewing plus lifestyle changes group had a significantly greater systolic	- blood pressure measurement at 6 months (primary) and at 9 months (secondary)	<p>- duration of trial was only 6 months so difficult to evaluate long-term impact.</p> <p>- Data collectors were paid for their</p>	Level I Quality B

			changes plus motivational interviewing.  Control group received general health education alone.	BP reduction at 6 months compared to the control health education group and persisted at 9 months.		time which makes program sustainability difficult.  -30% attrition rate  -3:1 ratio of women to men presented a gender bias.	
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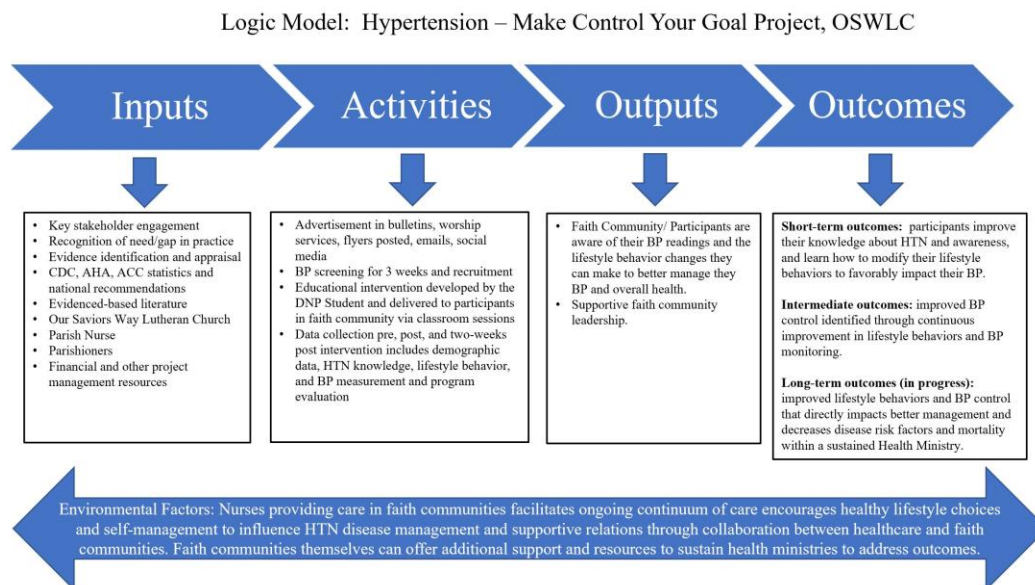
## Appendix C – Evidence-Based Theoretical Models

**Figure C1: Health Believe Model**



Source: University of Pennsylvania (n.d.)


**Figure C2: The Logic Model**



Source: Cooper & Zimmerman (2017)




## Appendix D - Advertisement Flyer



**THE GEORGE  
WASHINGTON  
UNIVERSITY**  
WASHINGTON, DC


## HYPERTENSION Research Study

### Learn Effective Strategies To Better Manage High Blood Pressure




**What is it:**

An evidence-based program aimed at improving self-care activities among parishioners to improve management of high blood pressure



**You are eligible if:**

- You are age 40 years or older
- You have been diagnosed with high blood pressure
- Or your blood pressure is 130/80 or over at screening session



**What's involved:**

- 2 weekly interactive group sessions
- American Heart Association Curriculum
- Blood pressure measurements and filling out surveys

Contact

Lynda Goodfriend, MSN, RN

Dr. Pearl Zhou

The George Washington University

**All sessions will be held at**

## Appendix E - Agreement with Project Site

### School of Nursing

THE GEORGE WASHINGTON UNIVERSITY

nursing@gwu.edu  
202-994-7901  
nursing.gwu.edu

Date: 04/29/2019

Re: Letter of Cooperation - [REDACTED]

Dear Lynda Goodfriend (GWU DNP student),

This letter confirms that [REDACTED], as an authorized representative of [REDACTED] church allow you (the project leader) access to conduct study related activities at the listed site under the tutelage of Quiping (Pearl) Zhou, Ph.D, RN, GWU nursing faculty (qzhou3@gwu.edu) and this student's primary project advisor, as discussed with you and briefly outlined below, and which may commence when the you provide evidence of IRB approval for the proposed project.

- **DNP Project Study Site:** [REDACTED]
- **Study Purpose:** The purpose of the project is to determine the effect of an educational intervention on hypertension management on participants knowledge and lifestyle behaviors to improve blood pressure control.
- **Study Activities:** Activities for this study includes the following: advertisement for this project will commence immediately after IRB approval (approximately August, 2019) followed by advertisement (flyers, bulletin, announcements at worship services). Recruitment will take place over several enrollment sessions, last about 2-4 weeks, and will include a short demographic survey and blood pressure measurements. This study will also be advertised to the community in hopes to maximize number of study participants. Implementation of the education will take place approximately late September to October. There will be two 45- minute educational sessions one week apart, and participants will be asked to come back a 3<sup>rd</sup> time 2 weeks post intervention to have their blood pressure taken. During the implementation phase, participants will be given 2 short surveys, one pre intervention and then again post intervention, and the second one 2 weeks post intervention (at end of the implementation phase).
- **Subject Enrollment:** Inclusion criteria would be subjects 45years old and over, male and female, with a self-reported diagnosis of hypertension, taking blood pressure medicine, or a blood pressure measurement of 130/80 mmHg or higher taken during enrollment screening. Excluded would be subjects who cannot have blood pressure taken in either arm or are cognitively impaired. Target sample size of study participants is 40.
- **Site(s) Support:** [REDACTED] agrees to provide you with leadership and administrative support and assistance from Pastors, Parish Nurse and other site personnel (to reserve room and technology setup, and any other guidance you may need), space to conduct the

intervention, and help with advertising and identifying persons who might qualify for study.

- **Data Management:** Data that will be collected includes demographic data via short survey, pre and post hypertension knowledge via survey, and pre and post intervention blood pressure measurements via valid blood pressure monitor device. All completed surveys collected will be kept in a locked boxed and data will be entered into an excel spreadsheet on the student's password protected computer which is kept at her house. All data will be de-identified to protect subjects' identification and printed surveys will be destroyed after data is aggregated.
- **Other:** *Is there anything you would like to add here?*
- **Anticipated End Date:** Approximate date for concluding all study activities at the site is January, 2020, unless otherwise noted.

We understand that this site's participation will only take place during the study's active IRB approval period. All study related activities must cease if IRB approval expires or is suspended. I understand that any activities involving Personal Private Information or Protected Health Information may require compliance with HIPAA Laws and GWU Policy. Our organization agrees to the terms and conditions stated above. If we have any concerns related to this project, we will contact the principal investigator. For concerns regarding IRB policy or human subject welfare, we may also contact the GWU IRB.

Regards,

  
Signature of Practice Site  
Authorized Representative

4/29/19  
Date

\_\_\_\_\_  
Full Name of Practice Site  
Authorized Representative

\_\_\_\_\_  
Executive Pastor  
Title of Practice Site  
Authorized Representative

## Appendix F – Blood Pressure Measurement Competency

**COMPETENCY: Blood Pressure Measurement**

Hypertension Education Church Project Study Staff Nurse: \_\_\_\_\_

Performance Steps	Method of Evaluation	Met	*Unmet	Evalu-ator Initials and Date	Study Staff Initials and Date
View video clip at: <a href="http://www.nejm.org/doi/full/10.1056/nejmvm0800157">http://www.nejm.org/doi/full/10.1056/nejmvm0800157</a> .	View 100% of video clip				
Describe how to determine the correct cuff size for the patient <ul style="list-style-type: none"> <li>Identify rubber bladder in cuff</li> <li>Bladder covers 80% circumference of arm</li> <li>Width of bladder 40% circumference of arm</li> </ul>	Return Demonstration				
Demonstrates correct patient positioning <ul style="list-style-type: none"> <li>Seated with feet flat on the floor</li> <li>Leaning against back of the chair not on arm</li> <li>Arm fully supported, brachial artery at heart level</li> <li>Upper arm bare, do not apply cuff over clothing</li> </ul>	Return Demonstration				
Demonstrates correct cuff placement <ul style="list-style-type: none"> <li>Apply cuff snugly</li> <li>Center of bladder is directly above brachial artery</li> <li>Bottom edge of cuff is 1" above elbow</li> </ul>	Return Demonstration				
Demonstrates palpatory technique of estimating BP <ul style="list-style-type: none"> <li>Inflate manometer while palpating radial pulse</li> <li>Note level at which radial pulse disappears</li> </ul>	Return Demonstration				

<ul style="list-style-type: none"> <li>• Release air from cuff slowly</li> </ul>					
Demonstrates correct technique of measuring BP <ul style="list-style-type: none"> <li>• Place stethoscope on brachial artery</li> <li>• Inflate cuff 20-30 mm Hg above the point where radial pulse disappeared</li> <li>• Systolic reading – first two consecutive sounds</li> <li>• Diastolic reading – at the level where the sound disappears, 2 mm Hg below the last sound</li> </ul>	Return demonstration or verification with instructor using a teaching stethoscope				
Verbalizes 2 things that may alter BP readings <ul style="list-style-type: none"> <li>• Caffeine</li> <li>• Medications</li> <li>• Incorrect Cuff</li> <li>• Bad Equipment</li> <li>• Bad Pt. Positioning</li> <li>• Incorrect Technique</li> <li>• Level of Brachial Artery</li> <li>• Smoking</li> <li>• Pain</li> <li>• Anxiety</li> <li>• Talking</li> <li>• Needing to Urinate</li> <li>• Nurse Bias</li> </ul>	Verbal test				
Verbalize the national standard for the normal BP reading for an adult...systolic <120 diastolic <80	Verbal test				

- If performance step unmet, write action plan here:

**Evaluator:** \_\_\_\_\_



## Appendix G - Permission to use HELM Knowledge Scale

**Schapira, Marilyn** <mschap@pennmedicine.upenn.edu>  
to me, mschap@mail.med.upenn.edu ▾

Tue, Apr 30, 5:25 PM (5 days ago)

Dear Lynda,  
Yes-you are welcome to use the HELM. Good luck with your study.  
Best-  
Marilyn Schapira



**Whittle, Jeffrey**  
to me, Kristyn, Julie ▾

Tue, Apr 30, 4:26 PM (5 days ago)

Ms. Goodfriend:

You are welcome to use the HELM. Since it was created with Federally funded research, there is no copyright. Do you have all the questions and response options?

Jeff Whittle

Learn about the Future of Healthcare at [www.joinallofus.org](http://www.joinallofus.org)



**Appendix H - Survey Tools****H1 - Demographic Data****1. What is your age?**

- a. 40-49
- b. 50-59
- c. 60-69
- d. 70-79
- e. 80 and older

**2 What is your gender?**

Male          Female

**3. What is your race or origin?**

- a. American Indian or Alaska Native
- b. Asian American
- c. Black/African American
- d. White/European American
- e. Hispanic origin
- f. Other (please specify)

**4. What is your highest level of education**

- a. Less than 12<sup>th</sup> grade
- b. High School or GED
- c. College or higher

**5. How long have you been told you have hypertension?**

- Less than 3 months
- 3-months to 1 year
- 1 – 5 years
- Over 5 years

**6. Do you smoke?**

Yes          No

**7. Do you exercise regularly?**

Yes          No

**8. Do you take blood pressure medication?**

Yes          No

**H2 - Hypertension Evaluation of Lifestyle and Management (HELM) Knowledge Scale****Pre and Post Hypertension Knowledge Survey Questionnaire**

The following questions are designed to test your knowledge of high blood pressure. You may find many of them to be hard. This is OK, just do the best you can. We will give you the answers to these at a later date.

**Please circle the correct answer:**

1.	A person is considered to have hypertension if either their SBP is 130 or higher or their diastolic is 80 or higher on two separate occasions.	True	False
2.	Most people can tell when their blood pressure is high because they feel bad.	True	False
3.	People with hypertension do not need to take medicine if they exercise regularly.	True	False
4.	Most people with hypertension need more than one kind of blood pressure medicine to control their blood pressure.	True	False
5.	Most of the salt Americans eat is added with a salt shaker.	True	False

Please choose only one answer for each of the following questions:

6. **A man reports that his blood pressure (BP) is 148/78 when he checks it using the BP machine in the pharmacy, 144/66 in his family doctor's office, and 132/74 when he checks it at home. Which of the following statements is TRUE?**

- A. It is common for blood pressure readings to vary like this.
- B. The highest blood pressure reading is the correct one.
- C. The lowest blood pressure reading is the correct one.
- D. He can be reassured that his blood pressure is normal.

7. **Which one of the following increases your risk of having hypertension?**

- A. Weight lifting.
- B. Drinking more than 2 cups of coffee a day.
- C. Smoking a pack of cigarettes daily.
- D. Gaining 15 pounds.

8. **Blood pressure is measured with two numbers, an upper number and a lower number. It is usually written as upper/lower. If someone is told that their goal blood pressure is 126/76, when have they reached that goal?**

- A. When the upper is below 126 and the lower is below 76.
- B. When the upper is below 126, even if the lower is over 76.

- C. When the lower is below 76, even if the upper is over 126.
  - D. When the average of the upper and the lower is less than 100.
9. **An overweight 60-year old man has hypertension. He drinks one bottle of beer and 4 cups of regular coffee a day. He adds regular table salt to his food at most meals. Which one of the following changes is the most likely to lower his blood pressure?**
- A. Lose 10 pounds.
  - B. Stop drinking alcohol.
  - C. Switch to decaffeinated coffee.
  - D. Switch to sea salt.
10. **Uncontrolled hypertension can lead to which of the following:**
- A. Lung cancer.
  - B. Kidney failure.
  - C. High cholesterol.
  - D. Diabetes.
11. **Which of the following statements about taking blood pressure medicine is TRUE?**
- A. Blood pressure medicine should always be taken with food.
  - B. More than one type of blood pressure medicine can be taken at the same time.
  - C. Blood pressure medicine works best if it is taken at bedtime.
  - D. Blood pressure medicine should not be taken if a person drank alcohol that day.
12. **When measuring your blood pressure at home, you should:**
- A. Always take your reading before you take your blood pressure medicine.
  - B. Take several readings, a minute or two apart, and record the lowest one.
  - C. Take your blood pressure right after exercising and at least two hours after a meal.
  - D. Take two readings, a minute or two apart, and write down the average value.
13. **Which one of the following changes to your diet is most likely to lower blood pressure?**
- A. Eat more fruits, vegetables, whole grains and low fat dairy products.
  - B. Eliminate spicy foods.
  - C. Drink one glass of red wine daily.



- D. Drink herbal tea instead of coffee.
14. **Which one of the following statements about exercise and blood pressure is TRUE?**
- A. People who are on their feet most of the day will not benefit from more exercise.
  - B. Exercising for 30 minutes every day lowers blood pressure more than exercising for 30 minutes, 3 days a week.
  - C. Weight lifting should be avoided by people with high blood pressure.
  - D. When exercising, you must raise your heart rate to at least 100 beats a minute to improve blood pressure.

*Source:* Shapira, et al., (2012). The development and validation of the hypertension evaluation of lifestyle and management knowledge scale. *Journal of Clinical Hypertension*, 14(7), 461-466.

**H3 - Pre and Post Lifestyle Behaviors – Salt Intake and Exercise**

1. During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?  
☐ Yes  
☐ No  
☐ Don't know/not sure  
☐ Refused
2. How many times per week or per month did you take part in this activity during the past month?  
☐ Times per week  
☐ Times per month  
☐ Don't know/not sure  
☐ Refused
3. And when you took part in this activity, for how many minutes or hours did you usually keep at it?  
☐ Hours and minutes  
☐ Don't know / Not sure  
☐ Refused
4. Are you currently watching or reducing your sodium or salt intake?  
☐ Yes  
☐ No  
☐ Don't know/not sure  
☐ Refused
5. If yes, how many days or weeks in the last month have you been watching or reducing your sodium or salt intake?  
☐ Day(s)  
☐ Week(s)  
☐ Don't know/not sure  
☐ Refused

*Source:* Centers for Disease Control and Prevention (2014) 2015 Behavioral risk factor surveillance system questionnaire. Retrieved from <https://www.cdc.gov/brfss/questionnaires/pdf-ques/2015-brfss-questionnaire-12-29-14.pdf>

## Appendix I – Project Timeline

[illegible]

**Appendix J - Evaluation Planning Matrix**

<b>Overall Program</b>	<b>Objective</b>	<b>Evaluation plan</b>	<b>Methods</b>
Improve participants' knowledge about hypertension	Increase participants knowledge of hypertension by providing education	All participants increase will have a significant increase in their knowledge score from baseline	Compare pre and post- test HELM knowledge scores using paired t-tests
Improve participant's lifestyle behaviors	Increase number of minutes participants exercise and increase number of days participants watch or reduce their salt/sodium intake	All participants will increase the number of minutes they exercise per week and decrease the number of days the watch or reduce their salt intake	Compare pre and post intervention self-reported lifestyle behaviors using paired t-test
Improve participants' blood pressure measurements	Decrease in blood pressure measurements	All participants decrease their immediate and 2 weeks post-intervention systolic and DBP from baseline	Compare pre- and post-intervention measurements and 2 weeks post intervention follow-up measurements using repeated measure ANOVA test
<b>Process Measures</b>	<b>Objective</b>	<b>Evaluation plan</b>	<b>Methods</b>
Feasibility of a hypertension educational program to improve knowledge and blood pressure control	Increase in participants' knowledge and improve blood pressure control	-Percentage of participants who completed the study intervention -Percentage of participants who dropped out prior to completing the study -Percentage of people who were willing to participate in the study -Percentage of participants who were	Categorical data

		satisfied with the program	
Identify barriers	Identify barriers that may prevent the successful implementation of this program	Components of the program that were identified at barriers to implementation process	Qualitative discussions and observances by project team
Successfully involve stakeholders	Include senior pastors and parish nurse in the project team to get buy-in and support and serve as change champions	Stakeholders supported the program 100%	Categorical data- level of support
<b>Structure</b>	<b>Objective</b>	<b>Evaluation plan</b>	<b>Methods</b>
Supportive leadership, parish nurse, technology and space to support health promotion program	Successful implementation of a health promotion program for management of hypertension	-100% leadership support -100% Parish nurse support -Availability of audiovisual equipment -Availability of a comfortable and spacious room to conduct education sessions	Yes No